MANAGING TOURISM LOGISTICS WITH SUSTAINABLE DEVELOPMENT OF ECO-TOURISM

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ABSTRACT

Nowadays, tourism has become a significant industry in Thailand's economy. Tourism generates high revenues, as compared to the revenues from exporting. Managing tourism logistics is increasingly becoming a strategic tool to facilitate and promote to tourism destination. Koh Lan is a beautiful destination in Thailand today. It is a coral island just out from the beaches of Pattaya City, in Chonburi province, Thailand. However, ever-increasing tourism has created problems there related to the sufficiency of its infrastructure systems and facilities. These problems include growing demand on natural resources and an escalation of environmental pollutants. Further, these problems are pointing to an urgent lack of effective logistical planning and management. This study applies principles of logistics management to the tourism industry under the hypothesis that how to move tourists from Pattaya to Koh Lan more efficiently and effectively, including providing an effective transport networking system, would increase and support tourism on Koh Lan. A demand forecast for tourism into the next decade is statistically calculated in order to provide recommendations for the improvement of infrastructure systems and facilities. An objective is to design tourism logistics system to promote sustainable tourism in Thailand by examining an appropriate demand forecast model for tourism on Koh Lan. The results would be used for planning infrastructure systems and facilities, including strategies for transport networks and logistics systems to support the future growth. Data is collected from secondary and primary sources, e.g. questionnaire and in-depth interview. The questionnaire is distributed to 150 potential participants, with 128 questionnaires being returned, for 85.3 percent return rate. Validity and reliability are examined. The result shows that a time series would be an effective model for a demand forecast. It reveals that tourism to Koh Lan would double in the next decade. This result would be used for designing transport and logistics systems from Pattaya City to Koh Lan. Today, more than 1,500 trips a day by ferry and speed-boats are used for tourist travel from Pattaya City to Koh Lan. Effectively designed infrastructure systems and facilities are required to support sustainable tourism on Koh Lan. Further, this study suggests that new and fantastic tourist facilities would be increasingly built on the island, underscoring the need for an appropriate plan for managing environmental pollution. Finally, this study points out that a reverse logistics system for garbage management would need to be effectively utilized. Rapidly increasing garbage is a problematic issue for logistics related to a sustainable, green, eco-friendly environment. This study concludes that strategic and integrated logistical management is necessary, with participation from all stakeholders.

INTRODUCTION

Nowadays, tourism has become a significant industry in Thailand's economy. Tourism generates high revenues, as compared to the revenues from exporting. Managing tourism logistics is increasingly becoming a strategic tool to facilitate and promote to tourism destination. Koh Lan is a beautiful destination in Thailand today. It is a coral island just out from the beaches of Pattaya City, in Chonburi province, Thailand. However, ever-increasing tourism has created problems there related to the sufficiency of its infrastructure systems and facilities. These problems include growing demand on natural resources and an escalation of environmental pollutants. Further, these problems are pointing to an urgent lack of effective logistical planning and management.

This study applies principles of logistics management to the tourism industry under the hypothesis that how to move tourists from Pattaya to Koh Lan more efficiently and effectively, including providing an effective transport networking system, would increase and support tourism on Koh Lan. A demand forecast for tourism into the next decade is statistically calculated in order to provide recommendations for the improvement of infrastructure systems and facilities. The use of logistics in the tourism industry is currently recognized as a strategic tool for enhancing tourist satisfaction in relation to lower travel costs, one-stop services, other conveniences and safety.

However, the research study (Briguglio 1995; Bryden 1973) shows that traveling destinations, especially in islands, typically fail to understand how to apply a logistics concepts as well as how to put logistics strategies into action. Therefore, the aim of this study is to examine an appropriate demand forecast model for tourism on Koh Lan. The findings are used for planning and developing infrastructure systems and facilities, including formulating strategies for transport networking and logistics systems to support the future sustainable growth of tourism industry. It also examines other logistical issues (i.e. role of demand forecasting and managing reverse logistics system for garbage).

1.1 Literature Review

This study reviews the literature related to the role of tourism (and in particular, eco-friendly tourism) to the economic growth of Thailand. It also considers the adoption of logistics management in the tourism industry, especially island tourism. Two relevant sources (Acharya 1995; Briguglio 1995; Bryden 1973) point out that effective logistics management contributes to the success of sustainable tourism development. These sources also review terminology of tourism logistics and logistics management as they pertain to sustainable development of tourism, but no one provides what is tourism logistics and how it contributes to tourism success.

It is important to understand a clear and concise concept of logistics from a tourism perspective. Logistics is mostly understood in term of business industries, with only a few research studies done exclusively in relation to tourism (Briguglio, Butler, Harrison and Filko 1996). People typically relate logistics (Bowersox & Closs 1996; Lambert, et al., 1998) to transportation or warehousing, particularly connecting it to aspects of material goods or information flow (Butler 1980; Theppitak 2006). As such, logistics is understood as a service-oriented process related to movement of physical and information flow. To apply logistics to tourism, people, or tourists, shall be considered as physical flow from one point

to another, and examined in terms of lower costs, higher safety and more convenience through excellent coordination and collaboration (Bowersox & Closs 1996).

The authors (Butler 1980; Briguglio 1996) points out that before logistical planning for tourism infrastructure and facilities can be achieved, there needs to be an accurate demand forecast developed. Demand forecasting for tourism into the next decade is statistically calculated in order to provide improvement for infrastructure systems and facilities, which can in turn support growth and expansion. However, very few researches have been done in area of tourism logistics (Butler 1980; Conlin & Baum 1995). It also reveals patterns of tourist behavior and other factors influencing travel decisions, as well as identifies problematic issues with tourist destinations (Conlin & Baum 1995).

Conlin & Baum (1995) states that there is a relationship between adoption of logistics management in the tourism industry and the success of sustainable tourism development. For instance, logistics management can be used to consider moving people, or tourists, from one point to another point (Theppitak, 2006). It provides tools for planning and facilitating to prepare accommodations, transport networks between and within locations to support sustainable tourism destinations (see Figure 1). However, it states that there is the gap for application logistics in tourism. This study applies a logistical approach to the tourism industry under the hypothesis that moving tourists from Pattaya to Koh Lan more efficiently and effectively, including providing an effective transport networking system, would increase tourist satisfaction on Koh Lan. Tourism is qualitatively different from the other domains within the cultural sector, as it cannot be readily classified as a sector in the traditional sense, i.e. as measured by either particular markets or industrial outputs. Therefore, it is better understood as a demand-driven, consumer-defined activity.

Figure – 1: *Relationships Between Activities in Tourism Logistics*
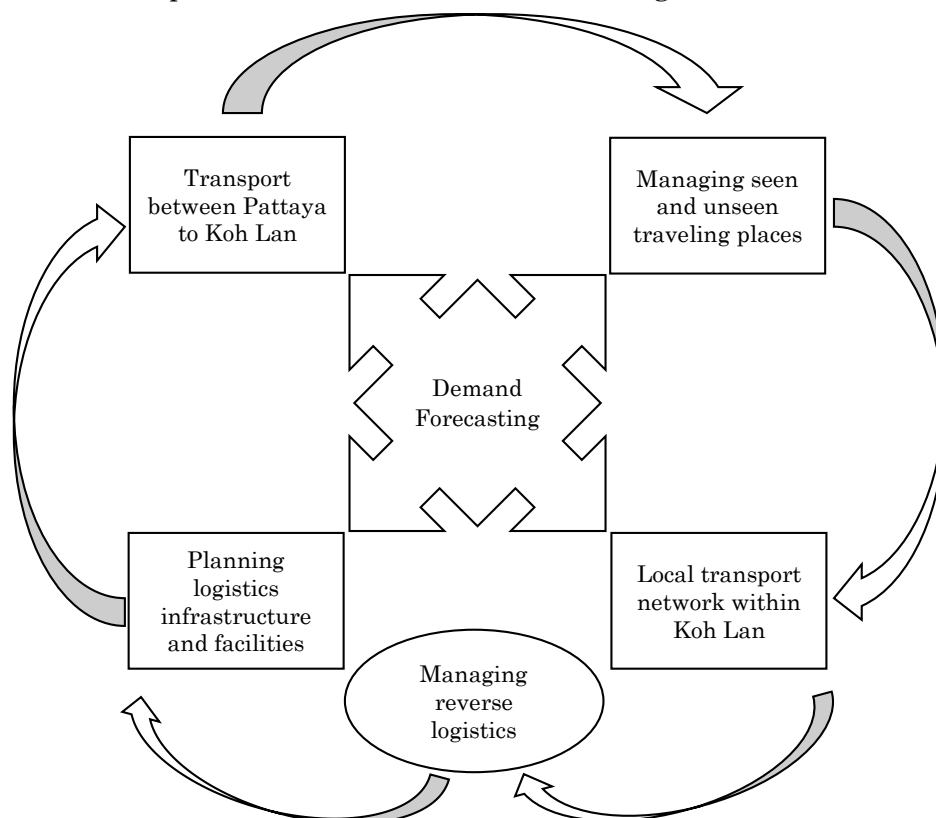
When considering the factors affecting logistics management adoption and implementation in tourism, particularly, tourism on islands, the literature points out the major factors are economic (i.e. inflation, unemployment), technological changes and political aspects (Thor, 1994). The research (Conlin & Baum, 1995) highlights relationship between such factors and the adoption of logistics management, like fluctuating tourist counts and tourist satisfaction.

It concludes there is a literature gap related to the examination of issues related to adoption of logistics management (and its effectiveness) within the tourism industry, and specifically for islands. In particular, there needs to be an examination of the factors contributing to the logistics adoption phase and the factors influencing sustainable tourism logistics development. This study therefore proposes a theoretical framework (Figure 2) derived from a previous study (Theppitak 2006).

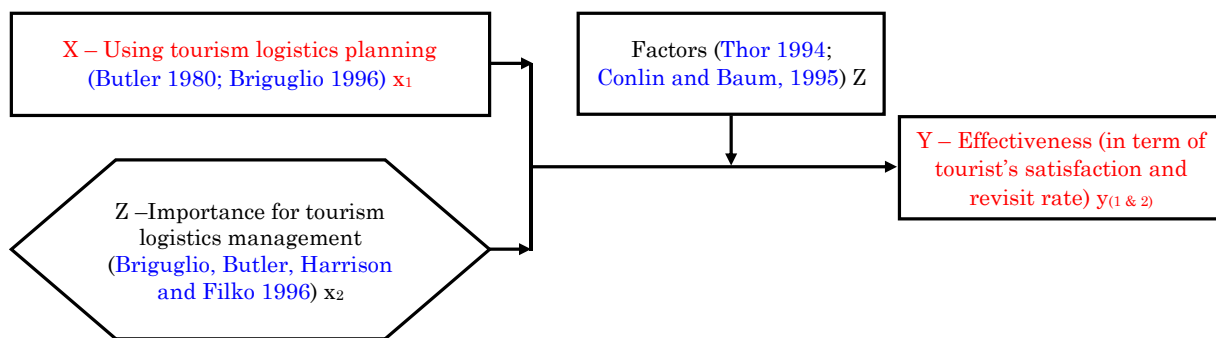**Figure – 2:** *Theoretical Framework of the Study*

Figure 2 shows the theoretical framework of variables in this study. The literature review reveals that building a sustainable tourism industry, especially tourism on islands, required effectively applied logistics concept and strategies. Success of sustainable tourism development requires a high priority of adoption of logistics planning. The research also reveals that the more organizations use logistics planning and management, the more effectiveness is gained for developing tourism (on an island) in term of tourist satisfaction. A main objective is to find ways to improve tourist satisfaction and rate of revisit.

This study examines relationship between variables (*X, Y, Z*), defining the adoption of logistics planning and logistics management as *an independent variable* (Variable X_1 and X_2) and defining the effectiveness of logistics management to tourism management on Koh Lan, in terms of tourist satisfaction (i.e. convenience, comfort, safety for transport network, infrastructure and facilities on Koh Lan), and return rate of tourist as *a dependent variable* (*Variable Y_1 and Y_2*).

Furthermore, this study examines factors, such as economic, technology and political aspects, are significant to the adoption of logistics management that would develop or enhance tourism system on the island. These influential factors are defined in the framework as *an intervening variable,* (Variable Z), which influences both the independent variable (*Variable X*) and the dependent variable (*Variable Y*). It is therefore assumed that the level of such influencing factors would have a direct correlation to the degree of importance placed on the adoption of logistics management, as well as to the effectiveness of any logistics using on the island.

RESEARCH METHODOLOGY

This study initially conducted *a literature review* related to the role and patterns of tourism on destination, in particular, islands from a logistics perspective, including the examination of problems and obstacles that occur while traveling on an island. It also explored the use of logistics management in the tourism industry. The objective of this study was to investigate the relationship between variables related to the adoption of tourism logistics management on Koh Lan, as well as the effectiveness of logistics management for building sustainable eco-friendly tourism.

An interview technique was used jointly with questionnaire surveys in order to obtain relevant and in-depth information from tourists on Koh Lan. To obtain the data, the questionnaires are used to a sample of 150 randomly selected tourists, which included both Thai and foreign tourists traveling on Koh Lan. However, 128 questionnaires are returned, for 85.3 percent return rate. Validity and reliability are examined This number of face-to-face questionnaires was based on a randomly stratified sampling. The rate of response was very good. The data collection period took one month.

2.1 Research Questions

To answer the above issues, research questions are defined as follows:
1. What is the terminology of tourism logistics?
2. What are behaviors of tourists with role of using logistics management for designing infrastructure and facilities on Koh Lan?
3. What are factors influencing the design and implementation of tourism logistics strategy on Koh Lan?
4. What is effectiveness of tourism logistics management?

2.2 Research Hypotheses

Based on the above research questions, hypotheses are established in order to examine a relationship between tourism logistics planning and management and the effectiveness of managing tourism logistics on Koh Lan. This study therefore examines a relationship of the variables under following hypotheses.

H_1 = There is a relationship between managing tourism logistics and a degree of tourist satisfaction.

H_2 = There is a relationship between tourism logistics management and increasing return rate of tourists to Koh Lan.

2.3 Population & Sampling Procedure

This study uses the number of tourists who traveled to Koh Lan during January 2018. 150 questionnaires were randomly distributed for the sampling. After several months, there were 128 questionnaires returned, for a response rate of 85.3 percent. This study also interviewed 30 tourists to gain their opinions related to tourism logistics on Koh Lan.

2.4 Data Collection

This study collects data in *two* following dimensions: first, a *literature review* is conducted in various fields related to tourism logistics management. Secondly,

questionnaire survey and in-depth interview method are used. Two pre-testing are conducted with Cronbach's alpha (α) at 0.85 and 0.87 respectively.

RESEARCH FINDING

The survey briefly explains demographical information related to attitudes and behaviors of tourists when visiting Koh Lan, including examining hypotheses. It shows that male and single tourists made up the greatest number of respondents in the sample at 56.8 percent, followed by female tourists at 43.2 percent. It shows that 63.9 percent are between the ages of 13 to 28 years. Most of them, or 38.9 percent, has an age between 21 and 28 years. Secondly, 25.2 percent has an age between 13 and 20 years. The major targeted groups of tourists on Koh Lan are now adolescent and young adult. The most tourists (86.2 percent) come from Asian countries (e.g. Thai, China, Taiwan, and South Korea).

The greatest percentage of tourists, or 71.2 percent, travels with their friends. Only 19.8 percent come with family, and their group was less than 5 persons (58.6 percent). Most of them or 33.3 percent, travels to Pattaya City by personal car, 30.6 percent of them visits by bus, and 17.1 percent by tourist bus, respectively during October – December (67.8 percent). Most of tourists or 87 percent identifies that they do not stay overnight on Koh Lan because of improper and inconvenient infrastructure and facilities.

Table – 1: *Summary of Testing Hypothesis*

Variable		Correlation	p-value
Independent	**Dependent**		
X_1	Y_1	0.82	0.000
Z	Y_2	0.63	0.000
X_2	Y_2	0.75	0.000

Table 1 shows summary of hypothesis testing. It tested that adopting tourism logistics planning (X_1) would have a relationship with tourist satisfaction (Y_1). Further, effective tourism logistics management (X_2) would increasingly encourage and promote increasing tourists' return rate to Koh Lan (Y_2). In term of tourism Logistics planning covers properly matching demand of tourists and services supply on the island, including organizing logistics networks (e.g. linking between seen and unseen traveling destinations, transport system, and accommodation) within the island. As tourism logistics management covers how well logistics management is used to create valve chain and promote tourism industry on Koh Lan, including providing reasonable costs, convenience and satisfying tourist need.

The result shows that adopting tourism logistics planning (X_1) has strongly relationship with generating tourist satisfaction (Y_1). It also reveals that tourism logistics management (X_2) has moderately relationship with increasingly promoting tourists' return rate to Koh Lan (Y_2). As some factors (Z) have moderately relationship to tourism effectiveness (Y_2).

DISCUSSION AND IMPLICATIONS

4.1 What is the Terminology of Tourism Logistics?

The findings reveal relevant patterns and trends of tourism on Koh Lan. The study shows that it would specifically establish a master plan of logistics development for eco-friendly tourism on Koh Lan. There needs to be an application of logistics principles to create and develop sustainable tourism. The key question is that what is the terminology of logistics in the context of tourism? Authors (Bowersox & Closs 1996; Lambert, et al., 1998; and Knox 1982) provide much definition but no one discusses what tourism logistics is. Their works focus on managing flow of industrial products and information.

Theppitak (2005) states in a definition that logistics is "the process of planning, organizing and controlling the flow of physical and information from origin to the end point to satisfy all stakeholders." Therefore, logistics in the context of tourism would be defined as "the management of the flow of physical (including tourists or vehicles) and information (information related tourism)". In this definition, tourists are being viewed as "goods," being moved from point to point. Transport system, between mainland and the island, as well as within the island, need to be designed to support the move of tourists in terms of lower costs, safety, comfort and convenience. Therefore, scope of tourism logistics also covers functions i.e., transport, infrastructure and facilities. (in Figure 1)

To support and foster more and better tourism on the island, infrastructure (e.g. electricity, water and telephone) must be readily available. Also, future tourist facilities (for all travel activities and including currently undeveloped areas) must be well planned and organized. These facilities should include hotels and other accommodations. If tourists are the goods, then hotels and resorts can be considered as warehouses or distribution centers. Proper demand forecasts of tourist behaviors and lifestyles are critical. In-depth and accurate logistics is the only proper way to prepare for future tourist accommodations, facilities and traveling activities.

Tourism logistics also includes reverse logistics activities. Reverse logistics can be defined as the management of the flow of materials or information back to a desired point. It covers the management of garbage disposal, or unusable materials. Normally, there are many methods to manage garbage, with different costs occurring, including non-monetary costs like pollution. This study can also be used logistically to incentive and support sustainable, more eco-friendly tourism on Koh Lan.

4.2 Demand Forecast Model and Designing Logistics Infrastructure and Facilities on Koh Lan

An objective is to design tourism logistics system to promote sustainable tourism in Thailand by examining an appropriate demand forecast model for tourism on Koh Lan. It shows that a time series would be an effective model for a demand forecast. It reveals that number of tourists to Koh Lan would double in the next decade. The results would be used for planning infrastructure systems and facilities, including strategies for transport networks and logistics systems to support the future growth. When consider pattern of transports systems between Pattaya City and Koh Lan (eight kilometer distance), tourists have two choices of transport to the island: ferry or speed boat. Tourists have intermediate expectation levels of service quality (e.g. convenience, safety and fee) for speed boats and ferries. After actually traveling to Koh Lan, they have satisfactory levels lower than their

expectation levels. It reflects that with speed boat services, fees and safety are the main sources of dissatisfaction. For ferry boat services, convenience and safety are the main sources of dissatisfaction. Tourists are satisfied when their perceptions equal or above their expectations. Therefore, the gap between tourists' expectation and perception needs to be closed.

To effectively improve transport systems between Pattaya City and Koh Lan, it would improve in two ways. First, reengineering existing transport systems by focusing on infrastructure and facilities (i.e. vehicle and harbors), software (i.e. signs, information to tourists) and peopleware (i.e. training crew with service minded). Second, new efficient and friendly environmental transport system (i.e. cable car and underwater car) would be considered.

The result shows that there are relationship between tourism logistics planning and satisfaction's tourists. Surveyed tourists reveal that they have high expectation in respect to beauty and atmosphere, cleanliness and safety, and that they are satisfied with these aspects of the island. However, they indicate some dissatisfaction with cleanliness and sanitary system, as well as some concern for the safety of security systems used at some travel destinations.

Managing tourism logistics in term of existing travel places is not considered only lower costs and higher services level, but it also means to manage all travel destinations in routes and vehicles. Unseen travel destinations would be effectively established and promoted. Obvious and clear signs between destinations become a source of satisfier.

When considering importance of tourism logistics management and satisfaction's tourists to transport system while visiting on Koh Lan. This study asks the tourists to rate the transport systems from Pattaya City to Koh Lan, as well as the transport systems within Koh Lan. Most of the tourists indicate high expectations related to safety and the expense of transportation. The study also shows that they are mostly satisfied with the availability and comfort of transport systems to Koh Lan. However, they are somewhat dissatisfied with the safety of transport systems to Koh Lan.

When considering the transport system within Koh Lan, tourists have high expectations for price standardization, as well as for comfort and availability of transport. However, they are dissatisfied to actually find a lack of price standardization of transport within Koh Lan. Logistics implication would consider in a whole system, and then set standard prices in each destination. The difficulty is how to communicate and motivate to local people for following to same standard without their resistance and conflict.

The interesting issue for infrastructure requires for supporting tourism on the island, it includes electricity, road, water, and telephone systems. Survey results reveal that most of the tourists (more than 75 percent) do not stay overnight in Koh Lan, but rather return to stay overnight in Pattaya City. The question is that why tourists did not stay overnight on Koh Lan. The interviewed results shows that most of tourists identify to unavailability and inconvenience in term of shortage, including high prices compared with earned services. They have high expectations for the costs and availability of tourism infrastructure in Koh Lan. But, they are dissatisfied with the actual fees charged for services and the availability of infrastructure.

These results reflect that there is a need to think and analyse a whole system. It would commence with forecasting future demand to provide properly infrastructure and

facilities. The study examines appropriate methods and seasonal time series would be the demand forecasting model which fits to tourism on Koh Lan. One of serious problems is garbage and pollutions occurring from tourism (appropriate 6-12 tons a day). Nowadays, the garbage is moved by 2 boats to Pattaya for disposal. Now the issue is increasingly becoming serious problems to friendly environmental tourism. It needs to apply concept of effective reverse logistics for creating and enhancing sustainable, eco-friendly tourism on Koh Lan.

In summary, the *main research finding* reveals that:
- Research shows that a time series would be an effective model for a demand forecast of tourists on Koh Lan.
- Tourism logistics planning (X_1) is a strong and positive relationship to tourist satisfaction (Y_1).
- Tourism logistics management (X_2) is a strong and positive relationship to return rate of tourist to Koh Lan (Y_2)
- Factors (Z) (i.e. economic, and political) is a moderate relationship to tourist satisfaction (Y_1 and Y_2) and they influence to decision making for traveling at Koh Lan.
- Lacking of effective demand forecast method is challenge and creates problems in mismatching between supply and demand, preparing infrastructure and facilities to tourists.
- Effective transport management (between Pattaya City and Koh Lan, and within Koh Lan) contributes to tourism's satisfaction and success.
- Currently, Koh Lan lacks tourism logistics planning and management.
- Garbage from tourists is increasingly becoming serious problem, it needs to design effective and efficient reverse logistics systems.
- Finally, it concludes that effective tourism logistics management is a key success to tourism on Koh Lan.

CONCLUSION

The result shows that using a logistics concept for tourism, especially on an island, would increase effective, sustainable, eco-friendly tourism. A demand forecast of tourism for the next ten years must be considered to effectively design and develop smooth flow patterns for future tourists, along with providing sufficient and appropriate infrastructure and facilities. It points out that a seasonal time series would be an appropriate model of demand forecasting. It reveals that in the next decade, tourism in Koh Lan would increase to twice its current level. This result must be taken into consideration for designing transport (and related logistics systems) from Pattaya City to Koh Lan.

Today, more than 1,500 trips a day, by ferry and speed-boats, are used in travel to Koh Lan. Effective design for future infrastructure systems and facilities must support sustainable tourism in Koh Lan. Likewise, development plans for new travel destinations must include an appropriate plan for managing environmental pollution. Finally, garbage management would be effectively planned using a reverse logistics system, as rapidly increasing garbage has become a problematic issue related to the logistics of maintaining a green, eco-friendly environment.

It provides valuable information for stakeholders, especially top management of Pattaya City and the Tourism Authority of Thailand, as to the planning and development of infrastructures and facilities for islands, and specifically Koh Lan. Effective transport management can facilitate growing tourist travel to and from Koh Lan, providing hotel, resort and residential-accommodation owners with consistently increasing demand, while also preventing the unrestrained destruction of natural resources and environments on the island. This study leads to the conclusion that strategic and integrated logistics management is required, with active participation from all relevant stakeholders.

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